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93 RF 9040

EG&G ROCKY FLATS, INC.

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July 26, 1993

93-RF-9040

J. K. Hartman
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and Environmental Restoration
DOE, RFO

Attn: R. H. Birk

TRANSMITTAL OF REVISED PAGES FOR THE OU 13 REVISED WORK PLAN - NMH-370-93

Enclosed are 10 copies of six pages from the Revised Operable Unit (OU) 13 Phase I RCRA Facilities Investigation/Remedial Investigation (RFI/RI) Work Plan which were revised per discussions between DOE, the Environmental Protection Agency (EPA) and the Colorado Department of Health (CDH) on June 15, 1993. Text changes were made to pages 5-27, 5-27a, and 6-38. Table 5.5 (page 5-28) and Figure 6-4 (page 6-43) were revised to reflect the changes in the text. Page 6-72 is also included because it was not received by the regulatory agencies with the last transmittal of revisions on June 1, 1993. EPA and CDH should be provided with two copies each.

It is our understanding that this transmittal is the last of the requirements from the regulatory agencies before they will grant final approval of the Revised Final OU 13 Phase I RFI/RI Work Plan. The agencies had verbally approved the Work Plan at the June 15, 1993 meeting.

We look forward to implementing this Work Plan in the next few weeks. If you have questions regarding this transmittal, please contact M. F. McHugh of Remediation Project Management at extension 8624.

N. M. Hutchins
N. M. Hutchins
Acting Associate General Manager
Environmental Restoration Management

MFM:dmf

Orig. and 1 cc - J. K. Hartman

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By *Bea Duran*Date *Aug. 11, 1993*

A-OU13-000206

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OU 13 File	X	
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in-depth borehole and surficial soil sampling will be conducted in Stage 2 (or Stage 3 if needed) to characterize the contaminant and collect additional data to support a human health risk assessment.

The following is the statistical approach used to determine the number of initial samples to collect. Given N independent samples, the probability of observing at least one contaminated sample when contamination affects a fraction of the site, is:

$$P = 1 - (1-f)^N$$

WHERE: f = fraction of site contaminated
 N = number of independent samples.

The assumptions are that at least 25 percent of the site is contaminated and the samples will be independent. Eleven samples are required to observe at least one contaminated sample with a probability of at least 95 percent within each IHSS group. IHSSs are grouped when their boundaries overlap or they are contiguous in such a manner as to present a discrete area and have similar potential contaminants of concern. Table 5.5 shows which IHSSs are grouped together for sampling purposes.

Judgmental sampling, based on historical information and results from the visual and HPGe surveys, will be combined with random sampling to bias the samples to improve detection of contamination. A visual survey will be performed to identify areas where elevated concentrations of contaminants are likely to exist. The results of the visual survey and the HPGe survey will determine the location of surface soil samples. A surface soil sample will be collected at each area where contamination is most likely to exist based on historical information and the visual survey. A surface soil sample will also be collected at anomalous areas identified by the HPGe survey. The remaining surface soil samples will be randomly selected throughout each specific IHSS area using grid points from the HPGe survey. Grid intersections that are located at any of the previously determined sampling locations will be exempted from the random sampling locations.

The results of the initial surveys will be carefully reviewed and the basis compared with background data gathered at Rocky Flats Plant. The comparison will be made using statistical techniques approved by CDH, EPA, and DOE. The results and analysis will be presented in a technical memorandum which will include the rationale and design for subsequent sampling.

Table 5.5

**SURFICIAL SOIL SAMPLING
IHSS GROUPS**

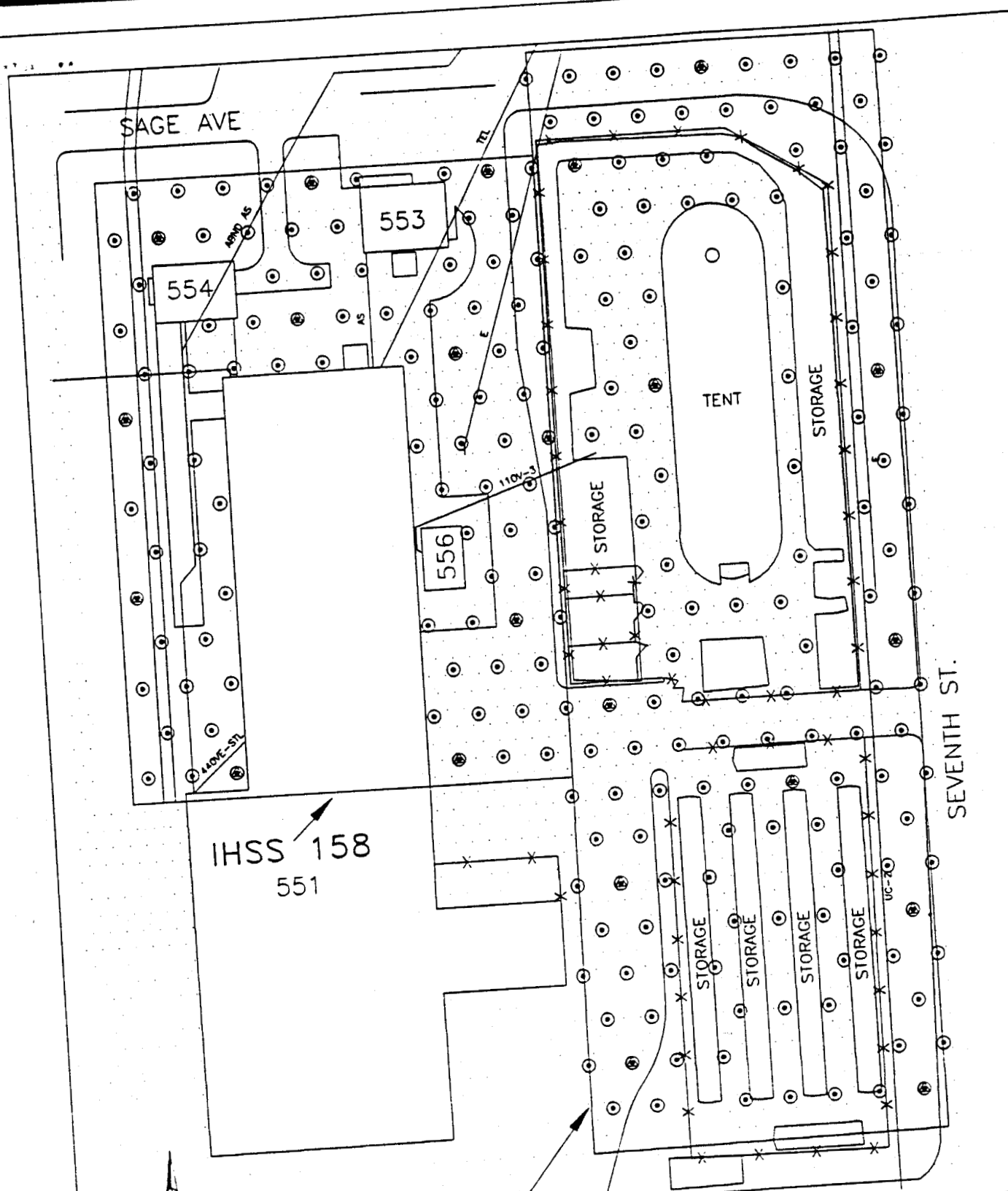
IHSS GROUP	NUMBER OF SAMPLES
117.1 & 197	11
117.2	11
117.3	11
158	11
148	11
157.1	11
186	11
134S up to but not including 171	11
134 N & 128 & 171	11
TOTAL	99

Surficial soil samples are not required for IHSSs 152, 169, 190, and 191.

In areas where the pavement may have been applied or the surface altered after the releases of interest, measurement of that radioactivity is much more difficult. The surfacing materials block most of the gamma ray emission associated with the source below the pavement. It is likely, however, that if the source was highly radioactive, a radioactive anomaly may be detected. Therefore, two methods of investigation will help insure that anomalous areas are identified. First, HPGe results will be carefully evaluated. Any anomalous readings will be investigated further to determine whether the anomaly is due to radiological contamination on the surface, or if the reading is a result of "breakthrough" from a radiologic source below the surface. Then, a few random asphalt samples will be taken to compare with the HPGe readings. The asphalt samples will be taken with a plug type corer and measured with either standard radiochemical analysis or with an onsite laboratory HPGe instrument. The SOPs for both the asphalt sampling and analysis and the laboratory HPGe instrument are currently being developed. These SOPs will be submitted to the regulatory agencies for approval prior to use in the field.

The second method is to take a soil sample as part of the surficial soils sampling plan from below the pavement and have it analyzed for radionuclides. The procedure (SOP GT.08) for sampling below the pavement is currently being revised and will be submitted to the agencies for their approval prior to using the procedure in the field. The pavement will be removed and a grab sample of the material directly below the pavement will be taken. After that sample is taken, another sample will be taken from below any obvious roadbase or preparation bed, or 4 inches deeper, whichever occurs first. These same samples will be analyzed for radionuclides, TAL metals and any other IHSS-specific metals listed in the IHSS sections below.

As discussed above, minimal numbers of surficial soil and depth profile samples will be collected to augment the results of the HPGe survey. At the time surficial soil samples are collected for analysis of nonradioactive parameters, the samples collected will be split and submitted for analysis of radionuclides. At those IHSSs where surficial soil sampling programs for nonradioactive parameters are not planned, surficial soil samples will be collected for analysis of radionuclides at a subset of the HPGe stations. After the completion of the HPGe surveys, the resultant data will be analyzed and used to locate vertical profile samples.



0 30 60
SCALE: 1" = 60'

OU132-5.DWG

Note: Vertical profile samples may be taken at some HPGe stations contingent upon HPGe results.
Refer to Fig. 2-2, MASTER LEGEND, for explanation of symbols.

U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden Colorado

OPERABLE UNIT NO. 13
PHASE I RFI/RI WORK PLAN

FIGURE 6-4

IHSS SAMPLING LOCATIONS
IHSS 158 & IHSS 117.2

Second Revised Final
June 1, 1993

During the drilling of new wells, borehole samples will be collected for analysis. The intervals sampled and the analytes for each sample will be the same as those defined above for Stage 2 (Table 6.4). If the Stage 1 and Stage 2 investigations indicate that a less extensive list of analytes will be required at any location, the analytes for samples obtained at that location will be specified in the technical memorandum submitted at the completion of Stage 2.

Groundwater samples will be collected from each well and analyzed for the list of constituents identified in Table 6.4. As with borehole samples, if a less extensive suite of analytes is required, the analytes for groundwater samples will be specified in the technical memorandum submitted at the completion of Stage 2. Samples will be collected from each new well immediately upon completion. Samples from existing wells and piezometers will be collected once at the time the Stage 3 investigation is initiated. Subsequent groundwater sampling will be performed as part of the site-wide monitoring program and will be arranged for by EG&G.

6.4 SAMPLING EQUIPMENT AND PROCEDURES

The following sections describe the sampling equipment and procedures to be followed in general terms. Details regarding each of the sampling procedures is provided in the SOPs referenced in the following sections and listed in Table 6.3.

6.4.1 Radiological Survey Procedure

Sampling locations are IHSS-specific and are discussed in Section 6.3. Radiological surveys will be conducted on 20-ft grids at all OU 13 IHSSs requiring such surveys unless visual inspection reveals that a larger grid size can provide 100 percent coverage of the investigation area. The established grids will provide approximately 100 percent coverage of the IHSS surface area. The HPGe has a broad energy range, exhibits high resolution, excellent gain stability, moderate area averaging, and the ability to identify and quantify all gamma-emitting radionuclides. The HPGe detector provides radionuclide concentrations in soil in picoCuries per gram (pCi/g) of gamma-emitting radionuclides including, but not limited to, potassium-40, radium-226, thorium-232, cesium-137, americium-241, plutonium-239, -240, and -241, and uranium-233, -234, -235,